WYOMING OUTDOOR COUNCIL, ET AL.

IBLA 2000-178 & 2000-324 Decided January 9, 2003

Appeals from decisions of the Acting Deputy State Director, Minerals and Lands, Wyoming, Bureau of Land Management, on State Director Review, affirming a Decision Record/Finding of No Significant Impact approving the Lower Prairie Dog Creek Coal Bed Methane Project, WY 0070-9-EA-238 (SDR WY-00-09), and affirming a Decision Record/Finding of No Significant Impact approving a Plan of Development under the Project, WY 0070-00-EA-124 (SDR WY-00-14.)

Set aside and remanded.

1. Environmental Quality: Environmental Statements--National Environmental Policy Act of 1969: Environmental Statements--National Environmental Policy Act of 1969: Finding of No Significant Impact--Oil and Gas Leases: Drilling

   Separate decisions approving a coal bed methane development project and a plan of development on the basis of environmental assessments and findings of no significant impact will be set aside when the record fails to show that BLM took a hard look at potential water quality issues from the production of coal bed methane.

2. Environmental Quality: Environmental Statements--National Environmental Policy Act of 1969: Environmental Statements--National Environmental Policy Act of 1969: Finding of No Significant Impact--Oil and Gas Leases: Drilling

   An environmental analysis of the impacts of a proposed coal bed methane project properly considers the potential cumulative impacts of the project together with other past, present, and reasonably foreseeable future actions which may interact to produce cumulatively significant impacts. It is error to fail to analyze the impacts of a reasonably foreseeable coal bed methane development project in the same watershed as the proposed project.

APPEARANCES: Daniel Heilig, Esq., Executive Director, and Thomas F. Darin, Esq., Director of Public Lands and Resources, Wyoming Outdoor Council, Lander, Wyoming, for the Wyoming Outdoor Council, Powder River Basin Resource Council, and Mike Foate; Susan L. Aldridge, Esq., and Michael J. Wozniak, Esq., Denver, Colorado, for the J.M. Huber Corporation; Lyle K. Rising, Esq., Office of the Regional Solicitor, U.S. Department of the Interior, Denver, Colorado, for the Bureau of Land Management.

OPINION BY DEPUTY CHIEF ADMINISTRATIVE JUDGE HARRIS

The Wyoming Outdoor Council and others (collectively WOC) 1/ have appealed from two decisions of the Acting Deputy State Director, Minerals and Lands, Wyoming, Bureau of Land Management (BLM). First, they have appealed from a February 18, 2000, decision of the Acting Deputy State Director, affirming, on State Director Review (SDR), a November 23, 1999, Decision Record/Finding of No Significant Impact (DR/FONSI) by the Field Manager, Buffalo Field Office, Wyoming, BLM, approving the "Lower Prairie Dog Creek Coal Bed Methane [(CBM)] Project" (Project). This case has been docketed as IBLA 2000-178. A second appeal, docketed as IBLA 2000-324, is from a June 23, 2000, decision of the Acting Deputy State Director, affirming on SDR a May 15, 2000, DR/FONSI by the Field Manager, approving a Plan of Development (POD), which would partially implement the Project. 2/ Because both appeals arise from the same facts and present substantially similar legal and factual issues, we have consolidated them for review by the Board.

In February 1999, Huber filed a proposal for the Project with BLM. Most of the land encompassed by the 34,560-acre Project is in private and State ownership (29,280 acres), with the remainder in Federal ownership (5,280 acres). The Project is one of a number of CBM projects proposed and ongoing in the Powder River Basin and adjacent areas of northern Wyoming and southern Montana. The Project would involve the drilling and development of a total of about 190 CBM wells in a 54 square-mile area of contiguous Federal and non-Federal surface and/or mineral estates situated in Ts. 57 and 58 N., R. 83 W., Sixth Principal Meridian, Sheridan County, Wyoming. About 70 wells dispersed throughout the Project area would be located on Federal mineral estate leased to Huber and others under several Federal oil and gas leases.

In deciding whether to approve the proposed Project, BLM prepared the Lower Prairie Dog Creek Coal Bed Methane Project Environmental Assessment (Project EA) (WY 0070-9-EA-238), dated August 27, 1999, as required by section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA), as amended, 42 U.S.C. § 4332(2)(C) (1994), and its

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1/ In addition to WOC, the appellants in both cases are the Powder River Basin Resource Council (PRBRC) and Mike Foate.

2/ By order dated Sept. 28, 2000, we granted the motion by the J.M. Huber Corporation (Huber), the proponent of the Project, to intervene in the pending appeal docketed as IBLA 2000-178.

implementing regulations (40 CFR 1500.1 through 1517.7). The EA analyzed the environmental consequences of the Project and alternatives thereto (including no action). The EA focused on the impacts within the Project area, which encompassed the area likely to be disturbed by CBM drilling/ development and related activity and a buffer zone surrounding that area. BLM referred to that entire area as the "study area." (Project EA at 1.) The proposed action (Alternative 1) was to drill and develop a total of approximately 190 CBM wells in the Project area, with no more than 70 wells being located on the Federal mineral estate. This total included the 125 wells which might be drilled by Huber and an additional 65 wells expected to be drilled by others in the Project area. The other alternatives considered were to authorize only 45 exploratory CBM wells (Alternative 2); provide alternate means for disposing of the recovered wastewater (including re-injection into the coal seam, injection into deeper aquifers, and undertaking other beneficial uses of the water) (Alternative 3); and a no-action alternative (Alternative 4).

Based on the analysis in the Project EA, the Field Manager issued his November 1999 DR/FONSI, concluding that Alternative 1, when modified by the additional mitigating measures set forth in Appendix D of the Project EA, and Attachment 2 to the DR/FONSI, posed no significant impact which would require preparation of an Environmental Impact Statement (EIS). The Field Manager also found that the drilling and development of Project wells would be consistent with the October 1985 Buffalo Resource Management Plan (RMP).

On December 27, 1999, as supplemented January 24, 2000, appellants sought review of the Field Manager's November 1999 DR/FONSI by the State Director, pursuant to 43 CFR 3165.3(b). Appellants contended that BLM's decision to approve the Project violated the environmental review requirements of section 102(2)(C) of NEPA and the land-use planning requirements of section 302(a) of the Federal Land Policy and Management Act of 1976 (FLPMA), 43 U.S.C. § 1732(a) (1994).

In his February 2000 decision (SDR WY-00-09), the Acting Deputy State Director affirmed the Field Manager's November 1999 DR/FONSI. He concluded that, in preparing the EA, adopting the FONSI, and approving the Project, BLM had not violated either section 102(2)(C) of NEPA or section 302(a) of FLPMA.

Appellants appealed to the Board from the Acting Deputy State Director's February 2000 decision. In conjunction with their appeal, appellants petitioned for a stay of the effect of the Acting Deputy State Director's February 2000 decision, pending our final disposition of their appeal on its merits. By order dated September 28, 2000, we denied their petition.

On May 15, 2000, while the appeal from the February 2000 decision was pending before the Board, BLM issued another EA (WY 0070-00-EA-124), in response to a POD filed by Huber for 13 Federal CBM wells within the Lower Prairie Dog Creek (LPDC) Project. The latter EA was tiered to the Project EA and specifically considered the environmental consequences of partially

implementing the Project under the POD by authorizing the drilling and development of the 13 CBM wells within the Project area, as well as alternatives thereto. These wells were to be drilled on Federal oil and gas leases WYW-116160, WYW-141522, and WYW-146387. Wastewater generated by the drilling and development of these wells was to be discharged at four points in the Project area, and the resulting methane gas was to be gathered, compressed, metered, and sold.

The Field Manager issued his May 15, 2000, DR/FONSI, approving the POD for the drilling and development of the 13 CBM wells, subject to Standard Conditions of Approval, set forth in Appendix D of the August 1999 Project EA, and additional mitigation measures, set forth at pages 6 to 13 of the May 2000 POD EA, which were specifically incorporated in the decision. The Field Manager also held that no EIS was required because this partial implementation of the Project was not likely to have any significant environmental impact.

On May 31, 2000, appellants sought review of the Field Manager's May 2000 DR/FONSI by the State Director, pursuant to 43 CFR 3165.3(b). Appellants contended that BLM's decision to approve the POD violated the environmental review requirements of section 102(2)(C) of NEPA and the land-use planning requirements of section 302(a) of FLPMA.

In his June 2000 decision (SDR WY-00-14), the Acting Deputy State Director affirmed the Field Manager's May 2000 DR/FONSI. He concluded that, in preparing the POD EA, adopting the FONSI, and approving the POD, BLM had not violated either section 102(2)(C) of NEPA or section 302(a) of FLPMA.

Appellants appealed the Acting Deputy State Director's June 2000 decision. In conjunction with their appeal, appellants petitioned for a stay of the effect of the Acting Deputy State Director's June 2000 decision, pending our final disposition of their appeal on its merits. By order dated October 4, 2000, we granted the petition. 3/ We subsequently granted a motion to expedite consideration of the appeal from that decision, by order dated February 1, 2002.

In order to extract the CBM gas from the coal-bearing Fort Union formation, Project wells would be drilled to a depth of from 250 to 1,500 feet and the formation would be de-watered to the extent necessary to release the entrapped methane gas. Drilling would take place using small, truck-mounted water well rigs, with four-man crews. Following drilling and cementing the casing from the surface to the top of the targeted coal seam, methane gas would be produced at an estimated rate of 50 to 700 thousand cubic feet (Mcf) per day. (Project EA at 12.) The gas would be gathered and transferred by buried pipeline to a maximum of five

3/ At the time the stay petition was adjudicated, BLM had not provided the Board with the administrative record which formed the basis of the BLM decision. The record was received subsequently and is now before us.

new compressor stations and from there to an existing central marketing point, where it would be sold to a pipeline company operating in the area. Id. at 12-14.

The Project area is in the Tongue River drainage. The Tongue River flows through the northwest portion of the Project area into Montana, then crosses back into Wyoming in the northeast section of the Project area, where it meets Prairie Dog Creek before exiting into Montana again. (Project EA at 3.) The Tongue River and Prairie Dog Creek are the only perennial water flows in the Project area. Other flows are small ephemeral or intermittent streams. Id. at 32. The mean annual flow of the Tongue River at the state line near Decker, Montana, is, based on data from 1960 through 1997, equivalent to 337,300 acre-feet or 466 cubic feet per second (cfs). Id. Based on data from 1971 through 1978, the mean annual flow for Prairie Dog Creek was 33,700 acre-feet or 47 cfs. Id. Flows in the river "are variable with over half the mean annual flow occurring in the months of May and June when the mountain snow pack melts." Id. Annual peak flows vary greatly for Prairie Dog Creek from 146 cfs in 1976 to 3,940 cfs in 1978, with an average of 796 cfs from 1971 through 1979. Id. The Tongue River and Prairie Dog Creek have well-established channels and flood plains, and their flood plains are used for irrigation throughout the Project area. Id. at 33. The Project EA notes that

> [t]he other streams in the area originate as gullies in the uplands between these major drainages and become grass-lined channels as their gradients flatten and they approach the broad valley floors of the major streams. Erosion in the upper reaches and deposition of eroded materials in the lower reaches of these drainages is a common and natural process.

Id.

Discharge water would "flow into the numerous incised, normally ephemerally-flowing drainage channels which dissect the broken topography in the project area." (Project EA at 16.)

> The discharge of water would most likely be distributed to approximately 20 to 40 points (or 5 to 10 wells per discharge point). Assuming an average production of 15 gpm [gallons per minute] per well, for the life of the well, the average discharge at any point should not exceed 150 gpm.

(Project EA at 15-16.) The total discharge from all 190 wells would be close to 6 cfs, "although no single discharge point will receive this entire amount." Id. at 55.

The recovery and discharge of wastewater from the Project would be regulated pursuant to water well permits, issued by the Wyoming State Engineer, and National Pollutant Discharge Elimination System (NPDES) permits, issued by the Wyoming Department of Environmental Quality (WDEQ),

thus ensuring compliance with State water laws and Federal and State water quality standards. Id. at 7.

Drilling was expected to take place on a staggered sequential basis over 5 years, with CBM production continuing over the estimated 10 to 20-year life of the Project. Id. at 9. Following the conclusion of operations at each well site, the well would be plugged and abandoned, and the site reclaimed.

[1] In preparing an EA to assess whether an EIS is required under section 102(2)(C) of NEPA, 42 U.S.C. § 4332(2)(C) (1994), an agency must take a "hard look" at the proposal being addressed, identifying relevant areas of environmental concern, so that it might make an informed determination regarding whether the environmental impact is insignificant or impacts will be reduced to insignificance by mitigation measures. Cabinet Mountains Wilderness v. Peterson, 685 F.2d 678, 681-82 (D.C. Cir. 1982); Maryland-National Capitol Park & Planning Commission v. U.S. Postal Service, 487 F.2d 1029 (D.C. Cir. 1973); Colorado Environmental Commission, 142 IBLA 49, 52 (1997); Oregon Natural Resources Council, 131 IBLA 180, 186 (1994). As a general rule, the Board will affirm a FONSI with respect to a proposed action if the record establishes that a careful review of environmental problems has been made, all relevant environmental concerns have been identified, and the final determination is reasonable. Owen Severance, 118 IBLA 381, 392 (1991); G. Jon Roush, 112 IBLA 293, 297 (1990); Utah Wilderness Association, 80 IBLA 64, 78, 91 I.D. 165, 173-74 (1984). The record must establish that the FONSI was based on reasoned decisionmaking. Thus, one challenging a FONSI must demonstrate either an error of law or fact or that the analysis failed to consider a substantial environmental problem of material significance. Oregon Natural Resources Council, 131 IBLA at 186; G. Jon Roush, 112 IBLA at 298. The ultimate burden of proof is on the challenging party and that burden must be satisfied by objective evidence. Mere differences of opinion provide no basis for reversal. Larry Thompson, 151 IBLA 208, 217 (1999); Oregon Natural Resources Council, 131 IBLA at 186; Red Thunder, Inc., 117 IBLA 167, 175, 97 I.D. 263, 267 (1990).

Of the myriad of NEPA issues raised by appellants, two are particularly troublesome. Those relate to assertions by appellants that BLM failed to take a hard look at water quality issues presented by the proposed Project and also failed to properly assess the cumulative impacts of all past, present, and reasonably foreseeable CBM activity in and around the Project area. 4/

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4/ Although BLM has questioned the standing of appellants, no motion to dismiss the appeals on this basis has been filed. Moreover, appellants have filed the affidavits of Mike Foate, a member of WOC and PRBRC, and Phyllis Bowden, a member of PRBRC, which support a finding of standing under 43 CFR 4.410(a) for all appellants. See National Wildlife Federation, 82 IBLA 303, 307-08 (1984).

Water Quality

In the Project EA, BLM stated that produced water would be discharged to area drainages and that, when not already present, stock ponds would be constructed to receive CBM discharge water. BLM represented that each pond would be built pursuant to a landowner agreement and permitted by the Wyoming State Engineer. "It is anticipated that each pond would receive discharge from 5 to 10 wells." (Project EA at 15.) According to BLM, water that was not lost to evapotranspiration would flow though a low-level outlet into the receiving drainage and pond spillways, which would be designed to handle storm flows and would be armored or maintained to minimize erosion. BLM stated that the proposed water disposal method had been practiced at other CBM projects and had been "well received by landowners." Id. BLM characterized the discharge water as "help[ing to] maintain water levels in stock ponds and support[ing] vegetation production and wildlife habitat along the receiving streams." Id. Regarding water quality, BLM stated: "Water quality of the CBM discharges is expected to be similar to that shown in Appendix B," which showed the results of one water sample taken on June 9, 1999, from the Pilch No. 9 CBM well in the Project area. Id.

In the POD EA, BLM stated that discharge of produced water from Federal lease wells would occur via buried pipeline systems "that connect the wells to outfalls located [sic] Prairie Dog Creek." (POD EA at 5.) The operator's water management plan, BLM asserted, "should minimize potential impacts from constant discharge of project CBM water on surface resources on the project area and downstream." Id. According to BLM, there would be "a beneficial impact to the surface owner" within the Project area from the surface discharge of CBM water. "The water, which is of good quality, will be made available for wildlife and livestock use." Id. The Project EA noted at page 33 that

> [w]ater quality of streams in the area changes continually. Most changes are related to the amount of and source of water flowing in the stream at any giventime. High flows result from snowmelt and/or precipitation and are characterized by low dissolved solids concentrations, although sometimes accompanied by relatively large concentrations of suspended sediments. During periods of low flow, much of the streamflow is water from the groundwater reservoir, such as bank storage and irrigation return flows. This water generally has higher mineral content than surface runoff because it is in contact with soil and rocks for a longer period of time.
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> TDS [total dissolved solids] concentrations in the Tongue River near the project area are generally below 500 mg/l (milligrams per liter) during high flows when surface runoff is the dominant source of discharge. This indicates water of drinking quality with only conventional treatment such as

> filtration and disinfection. The water is also of excellent quality for irrigation and livestock use. During low flows, TDS concentrations in the Tongue River may exceed 500 mg/l but stay below 1,000 mg/l, still well within suitable levels for irrigation and livestock use.

(Project EA at 33.)

BLM stated that the water quality of Prairie Dog Creek was "expected to be quite good also, as evidenced by the considerable amount of irrigation that is practiced throughout its length," although BLM predicted that TDS concentrations would probably be higher, "due to the smaller portion of runoff originating in the mountain snowpack." Id.

BLM predicted that environmental impacts of discharged water from the Project would fall into four categories: (1) erosion and degradation of the drainage network, (2) sedimentation, (3) disruption of surface activities, and (4) water quality. Erosion and degradation of the drainage network could result, BLM stated, if water discharge structures were improperly located or designed. BLM assumed, however, that proper engineering practices would negate such impacts. It did recognize that constant CBM discharges to drainages, which historically have been dry most of the time, would "represent a change in hydraulic characteristics" of those drainages. (Project EA at 55.) The result, BLM reported, could be increased vegetation in some areas due to increased moisture or decreased vegetation in other areas "if ponding occurs." Id. Vegetation types may change to wetland types, BLM stated, which could improve erosional stability of the channels, but such species might be "less desirable than current vegetation types for livestock forage." Id.

Sedimentation results when eroded particles are deposited by water as its velocity is reduced. Sedimentation will be avoided, BLM stated, by adhering to a water management plan that controls excess erosion. 5/

Discharged water could disrupt surface activities in a number of ways, BLM stated. Access problems could result for people and livestock who need to cross normally dry, ephemeral drainages that will become perennially wet due to the constant discharge of water. BLM recognized

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5/ BLM cites to Appendix C of the Project EA for an example of a water management plan for the Bar N Draw within the Project area. That plan states at page C-21:

> "Based on estimates of planned discharges to Bar N Draw, it is anticipated that water will reach Prairie Dog Creek on a continuous basis after the CBM project achieves full development. A review of the water quality from Prairie Dog Creek indicates an average TDS concentration during the irrigation season of about 1,250 mg/l. This is similar to the proposed discharges, and indicates that the CBM development will not adversely affect the suitability of water in Prairie Dog Creek for irrigation."

that many of the drainages that will be receiving discharges originate in upland areas and cross the valleys of Prairie Dog Creek or the Tongue River before joining those streams and, because "their channels are obscured or have been obliterated where they cross lands that are now irrigated," special measures must be taken "to convey these flows across or around the irrigated lands to avoid disrupting production or farming activities." Id. at 55-56.

BLM concluded:

> The CBM water is expected to be of the sodium carbonate type with a total dissolved solids concentration of about 1,000 mg/l. This is about twice what is normally seen in the Tongue River during the irrigation season. However, when mixed with the much larger flows of the Tongue River or Prairie Dog Creek the CBM discharge water will not affect the suitability of these streams for irrigation. The CBM water is also suitable for livestock water, and when added to natural flows will help maintain water levels in stockponds.
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> This increased daily flow is not considered an adverse impact because it would be available for beneficial uses such as livestock and wildlife watering and enhanced vegetation production. The surface landowners would most likely put the discharged water to beneficial use.

(Project EA at 14.)

The analysis offered by BLM in its EAs, based on the water quality analysis of only one water sample from a CBM well in the Project Area, led to its conclusion that discharged water should not adversely affect the suitability of the Tongue River and Prairie Dog Creek for irrigation and that such water can be put to beneficial use by landowners for livestock and wildlife watering and enhanced vegetative production. We do not believe this analysis constitutes the "hard look" required by NEPA. The record shows BLM's effort to be incomplete and inadequate. No mention is made in either EA of any deleterious impact of CBM discharge water due to its chemical composition, yet the record contains multiple documents supplied by appellants demonstrating the serious water quality issues presented by CBM-discharged waters.

Appellants provided an undated paper prepared by Robert Mitchell, who is identified in the record as a Soil, Air and Water Scientist in the Miles City District Office, BLM. The paper is titled, "Limiting Effects to the Tongue River Watershed from Coal Bed Methane Discharge Waters." (Appellants' Motion to Supplement Statement of Reasons, Ex. 16.) Therein, he states: "High sodium content in coal bed methane discharge waters will create conditions unfavorable for aquatic life, irrigation and other uses of Tongue River waters. Directly discharged onto the landscape, this water will result in plant mortality and lowered permeability and tilth of soils. To avoid effects to crop land and aquatic ecosystems, limits must be placed

on the salt load in the Tongue River." (Ex. 16 at 1.) According to Mitchell, the concentration and composition of dissolved constituents in water determine its suitability for irrigation and the two most important characteristics of water used for irrigation are: the total concentration of soluble salts, which is called salinity and for most purposes may be considered equivalent to TDS, and the relative proportion of sodium to other cations (calcium and magnesium), which is called the sodium adsorption ratio or SAR. The Project EA discusses the former; no mention is made therein or in the POD EA of SAR, except in a reference in Table 4 of the Project EA setting forth the WDEQ water quality criteria for livestock, agricultural, and domestic use. 6/ That table lists "SAR" for "Agricultural Concentration" as "8." (Project EA at 34.)

Appellants also provided a copy of an undated document prepared by Jim Bauder, Montana State University Soil and Water Quality Specialist, entitled "Coal Bed Methane Gas and Montana Water Quality," (Bauder Document) in which he made a number of general statements based on water samples of CBM water from the Tongue River watershed in Montana. 7/ (Notice of Appeal and Request for Stay Pending Appeal (Project N/A), Ex. 2, Ex. H.) 8/

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6/ In the June 23, 2000, decision of the Acting Deputy State Director, Minerals and Lands, on SDR of the Lower Prairie Dog Creek CBM POD, the Acting Deputy State Director acknowledged appellants' arguments concerning, inter alia, water quality and SAR. In response, he stated: "Water quality, SAR, mitigation and reinjection as well as the 'ignored impacts' (eg cumulative impacts) were discussed in the umbrella document [Project EA] in Chapters 3 and 4 as well as the SDR request response dated February 18, 2000." Despite the Acting Deputy State Director's representation, no reference is made in the Project EA to SAR.

7/ On page 6, Bauder states that the Montana Department of Environmental Quality provided him with "a few sets of data that identified the data as Redstone Gas Partners [(Redstone)]" and that the data were "prepared 6/29/98." It is unclear exactly where the data originated but the record also contains a copy of a Feb. 3, 2000, "Dear Reader" letter from the Miles City Field Manager, BLM, explaining that BLM continued to work on the environmental assessment regarding Redstone's CBM development proposal for exploratory drilling of 325 CBM wells in a 109,000 acre area of private, state, and public lands in Big Horn County near Decker, Montana. He stated that the eastern boundary of the Project area was the Tongue River and the southern boundary was the Wyoming state line. He explained that a total of 13 applications for permits to drill for CBM wells had been approved on BLM-administered minerals; that there were at that time no producing Federal CBM wells in southeastern Montana, and that, upon receipt of Redstone's proposal, BLM placed a moratorium on the approval of any additional applications pending completion of the EA.

8/ Some of the exhibits in the record consist of a compilation of separate documents which are also identified as distinct exhibits. Hence, some exhibits bear both a number and a letter designation.

He stated at page 2: "The water is marginally acceptable for irrigation based solely on salinity; however, the water is extremely unacceptable for irrigation based on the sodium levels; SAR greater than 15 is unacceptable." He also stated that according to

> [a]ll the data I've seen * * * this water is not suitable for irrigation, lawn watering or land spreading. Although the salinity level is not excessive, the sodium to calcium and magnesium ratio is extremely high. Sodium-rich water will cause all but the coarsest sands which are extremely well drained to disperse. This dispersion eventually leads to deteriorated soil structure, reduced infiltration, and poor drainage.

Id.

In comparing the SAR of the Tongue River with the SAR of the data for "19 different sampling points/wells," which he grouped into 6 data sets, Bauder noted that the Tongue River SAR was 0.79, while the average SAR of the 6 data sets was 34.8. Id. at 7-8. Another set of data designated as "Redstone Gas Partners, samples analyzed by Inter-Mountain Labs, Sheridan, WY. February 1999," had an SAR average of 51.9. Id. at 9. According to Bauder, CBM water could be used for irrigation if it were mixed with other supplies and it would depend on the volume and condition of the mixing waters.

In another undated document, a memorandum from Mitchell to the Miles City Field Office Manager, BLM, entitled "Coal Bed Methane produced water and its effects on the Tongue River Watershed" (Mitchell Memorandum), Mitchell further details impacts of CBM water. (Project N/A, Ex. 2, Ex. G.) 9/ Therein, Mitchell stated at 2-3:

> Production waters at a rate of 15 to 25 gallons per minute from an estimated potential of 357 wells (5 Pennaco, 102 Huber, and 250 Redstone) will significantly increase water flow in the middle Tongue River and tributaries. The increased flow by itself will have an effect on watershed hydrology and morphology. Channels will deepen and widen, areas of fluvial deposition and erosion will be modified, and amounts and types of riparian vegetation will be affected. At present, the watershed is stable in relationship to the present seasonal flows, soils, and vegetation. An increase in flows, particularly a proposed irregular increase, with discharge taking place in the winter months, will have an effect throughout the watershed on hydrology, soils, and vegetation.

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9/ Although undated, this document was apparently prepared sometime in 1999 or thereafter because two of the references cited by Mitchell are dated 1999: "Bauder, James, 1999, Coal Methane Gas and Montana Gas Quality" and "Sumner, Malcom E. (Ed.), 1999, Handbook of Soil Science."

> Total salts within coal bed methane production water are moderately high, but are within the range of surface water in eastern Montana. It is the composition and relative amounts of salts that creates a concern with disposal of this water. If the amounts of the three major cations - calcium, magnesium, and sodium - are in nearly equal amounts, effects on the plants and soils of the watershed are limited. Problems arise when the amount of sodium exceeds the combined amounts of calcium and magnesium as is the case with this water. The calculated relationship between these three cations is called the sodium adsorption ratio (SAR). SAR of the Tongue River is generally near or less than 1.0. Most crop and native plant species of the region can live with sodium adsorption ratios below 3. Salt tolerant native species, such as inland salt grass and greasewood are capable of handling an SAR up to 12. Above an SAR of 12, no local plant species, and very few terrestrial species will survive (Soil Improvement Committee, 1995).
>
> Sodium adsorption ratios from 12 to 70 are present in the production water which is to be discharged into local drainages and the Tongue River. Native vegetation below discharge points will be destroyed.
>
> Present plans of discharging production waters is to contain these waters during most of the year with earthen dams and discharging the water when the ground is frozen to reduce potential water erosion. Water removed from underground has a temperature above freezing. Water stored above ground in the detention dams will also have a temperature above freezing, so produced water discharged either directly or from a dam on frozen ground will thaw the surface and will initiate water erosion.

In discussing the impact of CBM produced waters on soils, Mitchell stated that dams created for storage of production waters would show salts around the edges of the reservoirs and where water moves through the dam to the downstream side. According to Mitchell, "[s]oils in this area are unable to retain all water behind them when used for dam construction. This water will seep through the dam face creating a vegetative dead zone downstream from the dam." Id. at 4. Mitchell also stated that the high SAR of the produced water would "destroy most vegetation in many areas from the discharge point until the water reaches the Tongue River. Once devoid of vegetation, soil erosion will occur with every event flow in the drainage." Id. at 5.

Mitchell concluded:

> The most insidious result of CBM production water release is that the effects may not be expressed for several years. Salt

> accumulations will continue and may ultimately result in formerly productive soils being replaced by saline/sodic soils. These soils will not be reclaimed without enormous expenditures of time and money and a concerted intrabasin effort. Plant composition along the Tongue River and tributaries drainages will be modified, allowing non-desirable species to invade.
>
> Other methods of dealing with production water must be analyzed which will have lesser effect on the ecosystem of this watershed. Injection of produced water to a deeper aquifer was not analyzed in the Tongue River Coal Bed Methane Environmental Analysis. Injection of CBM water is the method of disposal in the San Juan Basin of Colorado.

Id. at 6-7.

The Bauder Document and the Mitchell Memorandum had been provided to BLM for consideration during SDR. In his decision the Acting Deputy State Director offered some analysis of those documents. In an attempt to discount the impacts cited by Mitchell, he points to the conclusion of the Project EA at page 56 that CBM discharge water will not affect the suitability of the Tongue River and Prairie Dog Creek for irrigation purposes due to the mixing with the larger flows of these streams. While such a conclusion might be supportable, it is dependent on the water quality analysis of one water sample from one well. 10/

On appeal, appellants offer the opinion of Walter R. Merschat, President of Scientific Geochemical Services and a certified petroleum geologist, which is presented in a declaration dated January 24, 2000, which he offered following his review of the Project EA. (Notice of Appeal, Ex. 2, Ex. K.) Therein, Merschat stated that he has over 20 years experience in the field of oil and gas exploration, "which includes extensive background, research and analysis in coal bed methane extraction." (Merschat Declaration at 1.) In his opinion, BLM's use of one well sample to predict water quality for the entire Project area is

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10/ Mitchell expressly cites Bauder for the proposition that "[o]nce mixed with water in the Tongue River, the water should be suitable for crop irrigation." (Mitchell Memorandum at 5.) Nevertheless, Mitchell cautions that using such water over the lifespan of the CBM wells will result in salt accumulation in the soil. While proper irrigation techniques can limit such impacts, Mitchell states, improper use can result in fields that are unusable absent a further expenditure of time and money. "The effects of irrigation with the diluted production water may not be seen for a decade, and this [is] one area that needs further analysis to determine irrigation techniques suitable for this water and the soils of the Tongue River valley." Id.

"scientifically unsound." Id. at 2. He states that "the impacts on water quality for the project area have not been, by any standard, properly tested, assessed or analyzed by BLM." Id.

The Acting Deputy State Director stated that "[s]everal statements made in Exhibit G [the Mitchell Memorandum] on pages 2-3 and page 5 incorrectly infer that a high SAR in produced waters will result in destruction of most plant species in drainages and large amounts of soil erosion [which] is not a reasonable application of the concept of SAR." (February 2000 Decision at 6.) The basis for the Acting Deputy State Director's statement appears to be the conclusion that periodic flushing from natural events "should limit sodium accumulation." Id. The Acting Deputy State Director also takes issue with certain statements made by Mitchell regarding the stratification of CBM waters in reservoirs, particularly the Tongue River Reservoir just across the Wyoming-Montana border in Montana. Finally, the Acting Deputy State Director found nothing in the Bauder Document "to contradict the FONSI as written for the CBM EA." Id. at 7.

The Acting Deputy State Director's statements are based on an analysis of the Bauder Document and the Mitchell Memorandum provided by Joe Meyer, Soil Scientist/Hydrologist, Casper Field Office. (Undated "Response to WOC Supplemental information provided for Lower Prairie Dog Creek SDR Exhibits G and H.") The Acting Deputy State Director's statement regarding the flushing by natural events and the discussion on why stratification will not occur appear reasonable, based on Meyer's analysis of the documents offered by WOC. Nevertheless, Meyer does conclude that, absent mixing with natural waters, "SAR levels will prevent the use of produced water for irrigation * * *." Id. at 3.

The Project EA at page 68 refers to the preparation of water management plans as mitigation measures for surface discharge. The sample plan, set out as Appendix C in the EA, is for a drainage in the Project area, the Bar N Draw drainage, which consists of an ephemeral stream flowing only in response to snowmelt and precipitation that joins Prairie Dog Creek about 4 miles upstream from its confluence with the Tongue River. (Project EA at C-1, C-11.) Full project development, which in the Bar N Draw drainage would mean about 20 producing wells, would result in a continuous flow to Prairie Dog Creek. (Project EA at C-1, C-21.) The sample plan states that TDS in Prairie Dog Creek averages about 1,250 mg/l, which "is similar to the proposed discharge and indicates that the CBM development will not adversely affect the suitability of water in Prairie Dog Creek for irrigation." However, no mention is made in the sample plan of the SAR of the produced water.

Moreover, the plan provides that for the "one irrigation water right" recorded within the Bar N Draw drainage, "increased baseflows and constant flow of water as a result of the CBM development may provide more consistent irrigation and a higher potential crop production throughout the

duration of the CBM production," the clear implication being that such water would be available for irrigation, prior to mixing with Prairie Dog Creek. (Project EA, C-21.) The plan concludes that "[t]he increase[d] baseflow as a result of the CBM development will provide several benefits to the watershed including increased and consistent irrigation and livestock watering. Proper design discharge structures and maintenance of reservoir spillways, outlet works and culverts can prevent effects such as erosion and sedimentation from the CBM discharges." (Project EA, C-21, C-22.)

Thus, the document cited in the EA as providing mitigation for surface impacts from produced water not only does not acknowledge the adverse impacts due to the SAR of produced water, but cites the benefits of such water for irrigation. 11/ While a consistent flow of water would be a benefit, it would only be so if the water could be used for irrigation. The record shows, as evidenced by Meyer's analysis, that, prior to mixing, it could not. Absent notification of surface land owners regarding the potential problems with utilizing CBM discharge waters for irrigation, it is difficult to say that those waters, in all cases, would not be used for irrigation prior to mixing. Moreover, the benefits of mixing decrease as the amount of CBM waters entering a watershed increases. 12/

Appellants have also provided on appeal a copy of an April 20, 2000, letter to WOC from the Administrator, Water Quality Division, WDEQ, responding to objections raised by WOC to the issuance of 37 CBM discharge permits. (Appellants' Motion to Supplement Statement of Reasons, Ex. 14.) Therein, the Administrator stated:

> You based this request upon the concern that these discharges would result in high sodium and salinity releases to receiving waters and that these discharges would adversely affect

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11/ The Project EA states that the Tongue River and Prairie Dog Creek have well-established channels and flood plains and that the "flood plains are used for irrigation throughout the study area." (EA at 33.) With regard to Prairie Dog Creek, a "considerable amount of irrigation is practiced throughout its length." Id. The EA also states at page 56 that "[t]he surface land owners would most likely put the discharge waters to beneficial use."

12/ In that regard, we note that BLM's January 2002 "Draft Environmental Impact Statement and Draft Planning Amendment for the Powder River Basin Oil and Gas Project" (Draft EIS) analyzes the impacts of drilling and producing from an estimated 51,000 CBM wells, including 12,000 existing wells, within an 8,000,000 acre project area in Wyoming. (Draft EIS at ix, xvi.) Under the preferred alternative selected therein (Draft EIS at xxi), "[w]ater quality in the receiving streams would be expected to remain of suitable quality for irrigation purposes, except in the Upper Tongue River and the Upper Belle Fourche River." (Draft EIS at 4-64.) BLM stated that "[r]estrictions on salinity and SAR levels would be managed through the WDEQ's permitting process to protect these streams for use for irrigation." Id.

> agricultural uses of the receiving streams. You noted the protection requirements of our Chapter 1 rules, that obligate us to assure that surface waters of the state are protected for agricultural and wildlife uses. Finally, you note that these permits lack evidence that the discharge water will meet the standards.
>
> There is no disagreement that we must protect the surface waters of the Powder River Basin for their ongoing agricultural and wildlife use. We acknowledge the emergence of work done by Bauder, which questions the suitability of CBM waters for irrigation uses. We recognize there is limited evidence in these permits to assure the discharges will not adversely affect agricultural uses. We agree this concern needs to be resolved before these permits are issued so there will be no compromise to existing agricultural use of receiving waters.

The Administrator advised WOC that he would hold each new permit application until the Division received evidence from the applicant of its ability to comply with water quality standards and that he would only approve those permits for those applicants who could provide "convincing evidence" of compliance with water quality standards.

In his decision on the appeal of the POD SDR, the Acting Deputy State Director concluded that BLM had taken a "hard look" at the environmental effects of its action and stated, citing the Board's decision in The Ecology Center, 147 IBLA 66, 71 (1998), that "mere differences of opinion or disagreements do not suffice to establish that BLM's analysis is inadequate." It is true that the Board has stated on a number of occasions that a difference of opinion is insufficient to establish error on BLM's part. Larry Thompson, 151 IBLA at 217; Blue Mountains Biodiversity Project, 139 IBLA 258, 267 (1997), and cases cited. We have also held that a mere difference of opinion will not overcome the reasoned opinions of the Secretary's technical staff. Bill Armstrong, 131 IBLA 349, 351 (1994).

This case, however, does not present a situation of mere differences of opinion about water quality issues, with BLM presenting one opinion and appellants the other. Appellants have offered the opinions of a recognized expert from Montana State University and of one of BLM's experts, Mitchell, concerning the water quality issues surrounding CBM produced waters, particularly SAR. They also provided evidence that the WDEQ's water quality experts suspended approval of CBM discharge permits absent convincing evidence of compliance with water quality standards.

BLM sought to attack some of Mitchell's opinions in its Project SDR decision, on the basis of input from another BLM expert, Meyer. Whether or not those criticisms are legitimate, they do not undercut all the opinions expressed by Mitchell. Indeed, the thrust of both Bauder's and Mitchell's opinions is that CBM produced waters have potential to cause

severe environmental problems absent careful analysis and planning regarding use and disposal. Also, both cited the importance of SAR. However, BLM's Project EA offers the analysis of only one water sample taken in the Project area, an analysis that does not even include a calculation for SAR. BLM's POD EA likewise has no discussion of SAR, yet in his decision in the POD SDR, the Acting Deputy State Director cites the Project EA as addressing SAR. In addition, Mitchell's opinions cannot be easily dismissed as applying only to conditions in Montana; rather, they should be closely scrutinized in this case because they relate to conditions in the Tongue River watershed, the same watershed as the Lower Prairie Dog Creek CBM Project.

Thus, we are left with a Project EA that relies on one water sample to make conclusions about water quality for the entire Project area, for which no SAR is calculated; that contains no discussion of SAR for produced waters from the Project, despite the importance of that ratio; and that cites a water management plan as a mitigation measure for surface waters that makes no mention of SAR and implies, contrary to other evidence in the record, that produced waters may be used for irrigation, prior to mixing. Moreover, the POD EA references the Project EA as having discussed SAR. See note 5, supra.

On SDR of the two DR/FONSIs, appellants expanded on the water quality issues they had raised in comments on BLM's environmental analysis by raising the SAR concern and providing the Mitchell and Bauder documents. The Acting Deputy State Director responded by relying on Meyer's analysis of those documents. Meyer disputed several of the statements offered by Mitchell. However, BLM did not attempt to resolve those differences by seeking Mitchell's input, which it could have done because both Meyer and Mitchell are BLM employees. Instead, it forwarded a record to the Board containing apparently divergent views on several issues regarding SAR.

While the Board may look to post-EA generated materials in search of BLM's "hard look," those materials, in this case, present unresolved water quality issues. We do not believe that they can serve as the basis on which to conclude that BLM took a "hard look" at water quality issues. Neither the Project nor the POD may be approved on the present record. Accordingly, these cases must be remanded to BLM for an expanded examination of the water quality impacts of Project and POD approval. 13/ That

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13/ We do not hold, as appellants argue, that BLM must prepare an EIS. Such a conclusion would be premature. In this case, BLM failed to take a hard look at the water quality issues. Thus, it had an insufficient record on which to base its FONSIs. The fact that the Federal mineral acreage in the Project Area is only approximately 15 percent of the total and that such acreage may be subject to drainage does not negate BLM's responsibilities under NEPA.

examination should include the results of more than one water sample and should contain calculations of the SAR and a discussion of its relevance.

Cumulative Impacts

Appellants also argue that BLM, in its Project EA, erred in its analysis of the potential cumulative impacts of drilling CBM wells in the Project area because it failed to consider the cumulative impact of drilling wells in the Project area and of additional CBM wells planned for the rest of Sheridan County, and Johnson and Campbell counties, Wyoming, and adjacent areas of Montana, all of which are outside the Project area. They note that BLM did not address the cumulative impact of the recovery and discharge of large quantities of wastewater, in connection with large-scale CBM development, on surface water quality and groundwater quantity.

[2] Regulations implementing NEPA require that a Federal agency consider the potential cumulative impacts of a planned action together with other past, present, and reasonably foreseeable future actions. 40 CFR 1508.7. Cumulative impact is defined as:

> [T]he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 CFR 1508.7; see Southern Utah Wilderness Alliance, 122 IBLA 165, 169-70 (1992). In arguing that cumulative impacts were overlooked, appellants must show that there is likely to be an interaction due to geographic proximity or other factors between the proposed project and other projects which may result in enhanced or modified impacts. Wyoming Outdoor Council, 147 IBLA 105, 109 (1998).

In the Project EA at page 72, BLM discussed cumulative impacts, stating that there were additional wells proposed for lands adjacent to the study area as of August 10, 1999. It stated that the Wyoming Oil and Gas Conservation Commission had permitted 45 wells in T. 57 N., R. 64 W., on private and/or State minerals; that the Montana State Oil and Gas Commission had permitted 161 CBM wells on private and State minerals located in T. 9 S., Rs. 39 through 41 W., but that Montana BLM "has not permitted any CBM wells on federal minerals." It noted that Montana BLM was conducting an environmental analysis on a proposal to develop about 300 wells on combined private, State, and Federal minerals, but "any other information regarding development plans besides the number of wells proposed is not available for inclusion in the Lower Prairie Dog Creek EA." According to BLM, "[t]he total discharge from the 190 CBM wells is

approximately equal to the lowest discharge ever measured on the Tongue River at the state line, and is less than 0.03 percent of the highest flow ever recorded at that point." (Project EA at 73.) BLM concluded that "[n]o cumulative hydrologic impacts will result from the Lower Prairie Dog Creek CBM project and any other known[,] existing or planned projects." Id.

In response to the argument that it failed to properly assess the cumulative impacts of the Project and related projects in geographical proximity, BLM conceded in its Project SDR decision that "the NEPA guidance on the preparation was not followed as well as it should have been where the cumulative impacts section is concerned but cumulative impacts were considered throughout Chapter 4." (February 2000 Decision at 3.) BLM then recounted the conclusions in that chapter, including that "water quality [is] suitable for stock or irrigation if mixed with the Prairie Dog Creek or the Tongue River." Id. BLM further stated:

> The Redstone project, across the state line in Montana, is currently under an environmental analysis. The proposal is to develop about 300 wells on combined private, state, and Federal minerals in accordance with NEPA. The Montana project is still 60 to 90 days away from being final with a decision for the public on the project (per phone call to the Miles City Field Office). A concrete proposal was not in hand when the Lower Prairie Dog Creek EA was final. The Montana Project does not have an EA decision to approve wells on the Federal lands. The Wyodak project is at least 6 townships to the east toward the center of the geologic basin and the geology of the coals, watersheds, and methane play differ from the Lower Prairie Dog Creek project. They are not interrelated.

Id. at 4.

It appears that all of the CBM drilling and development identified by appellants consists of either ongoing actions or, at least, reasonably foreseeable future actions in Wyoming or Montana and therefore ought to have been considered, if cumulative impacts were likely to result therefrom. In the present case, appellants have failed to identify any cumulative impact which is likely to result from the contemporaneous drilling and development of CBM wells which are part of the Project and wells in other areas of Johnson, Campbell, or Sheridan Counties.

The wells referred to by appellants in Johnson and Campbell Counties are part of the Wyodak Project, 14/ which is 36 to 100 miles distant, with

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14/ The Wyodak CBM Project involves the drilling of a total of 6,000 CBM wells in a 3,600-square mile area, which contains about 2.317 million acres. BLM prepared an EIS for the Wyodak CBM Project.

differing geology of the coals, watersheds, and methane play from the Project in question. (Intervenor's Response at 4; February 2000 Decision at 4.) The producing coal bed formation and aquifer is asserted by BLM to be discontinuous between the Project and the Wyodak Project. (BLM Answer at 3-4.)

Appellants have not demonstrated that there will be any interaction of the Project with the other Sheridan County wells, which will be located "in an area ten times the size of the [Project] area," because most of these wells are from 6 to 18 miles from the Project area, "with many as far away as 72 miles." (Intervenor Response at 3.) We find appellants have failed to establish that BLM erred in not considering the cumulative impacts of these other wells.

However, the project in Montana involving the drilling of some 300 wells meets the geographical proximity test for inclusion in a cumulative impacts analysis. Produced waters from those wells will flow into the same watershed as that of the Project area -- the Tongue River. At the time BLM issued its DR/FONSI approving the Project, no environmental analysis for those wells had been finalized. Nevertheless, it is clear that much information regarding potential surface water impacts from that project existed. Accordingly, it should have been considered in the cumulative impacts analysis for the present Project. On remand, BLM should consider it.

In Wyoming Outdoor Council, 156 IBLA 347, 358 (2002), in which the appellants challenged a BLM decision dismissing a protest of three parcels offered for oil and gas leasing at the February 1, 2000, Federal oil and gas lease sale in Wyoming, this Board held: "Because the Buffalo RMP/EIS failed to take the requisite hard look at the impacts associated with CBM extraction and development, which clearly are relevant matters of environmental concern in this case, BLM could not rely on that document to satisfy its NEPA obligations for the proposed leasing decisions at issue here." Therein, BLM had also relied on the October 1999 Wyodak Final EIS to support the leasing of the parcels. The Board found that document to be insufficient also, stating at page 359: "[D]espite the Wyodak EIS' detailed analysis of the impacts of CBM development, * * * that document's failure to consider reasonable alternatives relevant to a pre-leasing environmental analysis fatally impairs its ability to serve as the requisite pre-leasing NEPA document for these parcels." Thus, we found BLM's environmental documentation insufficient to support its decision to lease the three parcels at issue in that case. 15/ In the present case, however, leases have issued and the actions being challenged are post-leasing events, i.e., BLM's approval of the Lower Prairie Dog Creek CBM Project and the POD for certain CBM wells within the Project Area.

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15/ On Oct. 15, 2002, the Board denied BLM's petition for reconsideration of the Board's decision. Wyoming Outdoor Council (On Reconsideration), 157 IBLA 259 (2002).

The Record of Decision (ROD) for the Buffalo RMP authorized continued leasing and development of Federal oil and gas in the Buffalo Resource Area. CBM drilling takes place on Federal minerals under a Federal oil and gas lease. There is no separate leasing for CBM. Nevertheless, the EIS, which supported the ROD for oil and gas leasing in the Buffalo RMP, did not include any discussion of the impacts of CBM extraction and development.

An EA or an EIS addressing the water quality issues associated with CBM extraction and development could support the decisions under review. In the Project EA, BLM stated that the EA was being tiered to the Buffalo RMP/ROD. However, the EIS supporting the Buffalo RMP/ROD, which authorized continued leasing and development of Federal oil and gas, did not address the impacts of CBM extraction and development. Thus, BLM may not look to that EIS to support its claim that it took a "hard look" at the water quality issues of approval of the Project and POD. Moreover, as we have stated above, neither the Project EA, the POD EA, nor BLM's post-EA analysis on SDR supports the conclusion that BLM took a "hard look" at water quality issues. 16/

All other arguments raised by appellants have been considered and are hereby rejected.

Accordingly, pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 CFR 4.1, the decisions appealed from are set aside and the cases remanded for action consistent with this opinion.

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Bruce R. Harris
Deputy Chief Administrative Judge

I concur:

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Gail M. Frazier
Administrative Judge

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16/ We need not address appellants' argument that amendment of the RMP is required before CBM development in the Project area may take place. We note, however, that BLM is in the process of amending the Buffalo RMP. See note 12, supra; Draft EIS at xxi-xxii.

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Lisa Hemmer
Administrative Judge

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David L. Hughes
Administrative Judge

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Will A. Irwin
Administrative Judge

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T. Britt Price
Administrative Judge

ADMINISTRATIVE JUDGE GRANT DISSENTING:

I find that I must respectfully dissent from the finding of my colleagues that BLM violated the National Environmental Policy Act (NEPA) 1/ in its decisions approving development of the "Lower Prairie Dog Creek Coal Bed Methane [(CBM)] Project" (Project) and the related Plan of Development (POD). I recognize that the environmental analysis in this case was somewhat truncated with a significant portion of the total analysis developed in response to comments tendered on the environmental assessments (EA's) prepared by BLM. I find, however, that appellants have failed to sustain the burden of overturning the BLM finding of no significant impact (FONSI) in this case.

In evaluating whether BLM has taken a hard look at environmental impacts necessary to support a FONSI, this Board has found it proper to consider the entire record including comments, responses, and analysis generated before and after the EA was prepared. Oregon Natural Resources Council, 131 IBLA 180, 186 (1994); National Wildlife Federation, 126 IBLA 48, 56 (1993). The Board will affirm a FONSI with respect to a proposed action if the record establishes that there has been a careful review of environmental problems, all relevant environmental concerns have been identified, and the final determination is reasonable in light of the record. Owen Severance, 118 IBLA 381, 392 (1991); G. Jon Roush, 112 IBLA 293, 297 (1990); Utah Wilderness Association, 80 IBLA 64, 78, 91 I.D. 165, 173-74 (1984). The ultimate burden of proof is on the challenging party, and this burden must be satisfied by objective evidence. Mere differences of opinion provide no basis for reversal. Red Thunder, Inc., 117 IBLA 167, 175, 97 I.D. 263, 267 (1990); G. Jon Roush, 112 IBLA at 297-98.

One of the primary issues in this case is the quality of the CBM discharge water and its effects on the environment. Based on its sampling, BLM estimated that the water produced by the proposed CBM wells was likely to contain total dissolved solids (TDS) close to 1,000 milligrams per liter (mg/l). (Project EA at 56; see Project Decision Record (DR)/FONSI, Attachment 3, at 1 ("The average TDS concentration in water from 14 coal seam wells[,] * * * located near the study area, is 1161 mg/l"); Project EA at 28-29; Project EA, Appendix B ("Water Quality Analysis Pilch No. 9 CBM Well"), at B-1.) The TDS content of water reflects the total concentration of dissolved salts (salinity), and is used to evaluate the impact of releasing such water into the human environment. (Ex. 16, "Limiting Effects to the Tongue River Watershed from Coal Bed Methane Discharge Waters," Robert Mitchell, Soil, Water, and Air Specialist, Miles City Field Office, Montana, BLM (Mitchell Paper) attached to Appellants' Motion to supplement statement of reasons, dated May 2, 2000, at 1.) The expected 1,000 mg/l TDS level, is lower than the average level for Prairie Dog Creek during the active irrigation season (1,250 mg/l), and is considered

1/ 42 U.S.C. § 4332(2)(C) (1994).

acceptable for livestock consumption. (Project DR/FONSI, Attachment 1, Comment Responses (Letter A), at 5-6 ("Total dissolved solids (TDS) levels from 14 nearby coal seam wells average 1161 mg/l, well within Wyoming standards for livestock water").) The anticipated discharge is not expected to impair suitability for irrigation purposes when mixed with waters from either Prairie Dog Creek or the Tongue River. (Project EA at 33-34, 56, and Appendix C, Bar N Draw WMP, at C-21.)

The issue of the impact of the sodium adsorption ratio (SAR) in CBM discharge water (as distinguished from the measure of salinity provided by the level of TDS) was not raised during preparation of the EA or in the comments filed in response to the EA. The term SAR refers to the relationship between the sodium, calcium, and magnesium cations in the water. (Ex. 2, Ex. G, at 2.) 2/ This issue was first raised in exhibits filed with BLM in support of the request for State Director Review (SDR) of the FONSI. The majority finds the BLM analysis on SDR to be inadequate to sustain the FONSI, particularly in view of the lack of data on the SAR in CBM discharge water in the Lower Prairie Dog Creek (LPDC) Project area. Reference to the information provided by appellants' experts helps to put this potential shortcoming in better context.

Jim Bauder reported that the average SAR content of water discharged by two groups of CBM wells in Montana is 34.8 and 51.9. (Ex. 2, Ex. H, Bauder Report at 7, 9.) He noted that this is more than double what is considered acceptable for irrigation purposes, or "excessively high," and that, to the extent that it is discharged on "any soil with any degree of aggregation," it is likely to cause "significant dispersion," thus reducing the porosity of the soil, and impeding agricultural use. (Ex. A, Ex. 3, Bauder Guidelines at 16.) However, once the discharged water reaches the river and mixes with that larger flow, no adverse impact is expected when the river water containing the discharge is used for irrigation. Id. at 11. Bauder's "bottom line recommendation" regarding use of CBM discharge water for irrigation would be to "[a]lternate between irrigating with discharge water and river water." Id. at 16.

When evidence of the significance of SAR, as a factor in the impact of CBM drainage water, was raised during SDR of the Project DR/FONSI, BLM consulted with Joe Meyer, Soil Scientist/Hydrologist with the Casper Field Office. It is asserted by BLM that land in the area of the Project is primarily used for livestock grazing and that irrigation using water discharged from the Project would involve water withdrawn from the Tongue River after the discharge water mixed with Tongue River water. (BLM Answer at 1-2.) There is nothing in the record that would indicate an intent to use the CBM water generated by the LPDC Project for irrigation purposes

2/ Some of the exhibits in the record consist of a compilation of separate documents which are also identified as distinct exhibits. Hence, some exhibits bear both a number and a letter designation.

prior to its entering Lower Prairie Dog Creek or the Tongue River waters. Although Meyer acknowledged CBM discharge water is not suitable for "irrigated agriculture," he also noted that the Project does not envision the use of discharge water for irrigation before it reaches the other flows. Meyer cited the finding in the EA that, when mixed with the much larger flows in Prairie Dog Creek and/or the Tongue River, the CBM discharge water will not adversely affect the suitability of these streams for irrigation. (Attachment to Feb. 18, 2000, SDR decision at unnumbered 1-2, citing EA at 56.) Although the EA focused primarily on the TDS level as opposed to the SAR, Bauder himself recognized, as noted above, the reasonable expectation is that, once CBM discharge water mixes with the much larger flow in the perennial streams, there will be no material adverse impact on use for irrigation.

This conclusion is consistent with the facts of record. Prairie Dog Creek has a mean annual flow of 47 cubic feet per second (cfs). At the point where it exits the Project area at the State line, the Tongue River has a mean annual flow of 466 cfs. (Project EA at 32.) The total discharge, if all 190 wells discharged simultaneously at their projected maximum flow, would be approximately 6 cfs. Id. at 55. At the projected discharge rate of 15 gallons per minute (gpm), 3/ the total discharge of the 70 Federal wells would be 2.34 cfs. 4/ This would be less than 5 percent of the mean annual flow of Lower Prairie Dog Creek and less than 0.5 percent of the mean annual flow of the Tongue River. 5/ It can be reasonably anticipated that the discharge at any given time during development will be less than this level. Appellants have not disputed the assertion by the operator (Huber), supported by the record, that it is improper to aggregate the total number of Project wells and assume a uniform rate of water recovery by each well. The wells will not be drilled and be producing water at the same time or at the same rate: "[A]ll wells will not be drilled at once, thus allowing water production from early

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3/ Project EA at 12, 15-16, 52, 54.
4/ One GPM is the equivalent of 0.002228 cfs.
5/ The EA prepared by BLM for the LPDC Project analyzed the effects of development of all 190 projected wells including 120 wells on private or State lands as well as the 70 wells anticipated on Federal leases. This makes sense in that environmental impacts are better analyzed and more effective mitigation measures can be developed when the entire Project is considered. It is clear from the record, however, including the motion to expedite review based on the ongoing drainage of gas from the Federal leases through non-Federal wells, that development of the CBM on State and private lands as well as that drained from Federal leased tracts has occurred and will continue to occur regardless of BLM approval. Development of the 120 non-Federal wells is not an indirect effect of the BLM decision and their impact would not invalidate the FONSI in this case. In upholding a BLM decision regarding a project on public lands when the EA did not evaluate anticipated development on adjacent private lands, the

wells to decline by the time additional wells are commenced" and "all water produced will never be produced at maximum flow rates at any given time." (Huber Response at 16; see Project EA at 11 ("The project would be phased in time and location"); Ex. A, Ex. 5 ("Interim Drainage Report on Coalbed Methane Development in T. 43-52 N., R. 70-75 W., Campbell County, Wyoming," Wyoming, BLM) attached to July 2000 notice of appeal/petition, at 1.) The record further discloses that the well water will be discharged at from 20 to 40 separate points within the Project area, and only a fraction of the total project discharge will affect a particular surface drainage or receiving waterway. (Project EA at 16.)

Addressing Bauder's statement that 1000 CBM wells each flowing at 10 gpm would cause a change in SAR in the Tongue River from 0.79 to 3.17, Meyer points out that this rate represents a total flow volume 3.5 times greater than the projected discharge from the 190 wells in the LPDC Project. (Attachment to Feb. 18, 2000, SDR decision at unnumbered 1.) As BLM has noted on appeal, Mitchell has indicated that there would be no significant impact to crops and soils along the Tongue River if the SAR of the mixed waters is kept below three. (Ex. 16 at 3.) Discussing potential impacts to erosion and survival of vegetation in the drainage, Meyer stated that, in contrast with an irrigated field where sodium continues to accumulate if not removed by leaching, a natural stream channel is periodically flushed by precipitation or snow melt runoff events, which remove any accumulated sodium. (Attachment to Feb. 18, 2000, SDR decision at 2.)

Accordingly, while on appeal the appellants have made many assertions regarding potential impacts of CBM discharge water as a consequence of the SAR level, these concerns have been addressed in the record, and when viewed in its entirety, the record supports the FONSI in the context of the LPDC Project and the POD.

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fn. 5 (Continued)
Board noted that the indirect effects of the proposed Federal action must be considered if those effects are caused by the BLM action:

> A "reasonably close causal relationship" between the Federal action and the effects at issue is critical, and where the "causal chain" is unduly lengthened, NEPA does not apply. See Metro. Edison Co. v. People Against Nuclear Energy, 460 U.S. 766, 774-75 (1983). We have concluded that it cannot be said that the Federal action in this particular case is the cause of the impacts associated with private development, as BLM's decision to grant the right-of-way in this case is not the physical cause of any "indirect effects" associated with the construction of the subdivision. This is evident when one realizes that the subdivision would very likely proceed even if BLM denied Henderson's application for a right-of-way.

James Shaw, 130 IBLA 105, 113 (1994).

My colleagues in the majority also find that BLM erred in failing to consider the cumulative impacts of development of the LPDC Project when added to the potential development of 300 proposed or permitted CBM wells in the Tongue River watershed in Montana. Regulations implementing NEPA require that a Federal agency consider the "impact on the environment which results from the incremental impact of the [Federal] action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 CFR 1508.7. The proposed Federal action in this case is the BLM authorization for drilling CBM wells to tap mineral resources owned by the United States. Federal oil and gas interests constitute only 12 percent of the total Project area from which CBM is being developed. (Project EA at 6.)

As noted above, the record indicates that the CBM resources on State and private lands within the Project area are already being developed. The Board granted a motion for expedited review in this case in response to BLM's assertion that the Federal CBM resources are being drained by active wells on adjacent State and private lands. These operations are ongoing and will continue regardless of whether CBM is produced from Federal lands.

One result of the remand in this case will be that an unknown portion of both the Federal CBM and associated water will be drained through wells on State and private tracts. The discharge water from these wells will not be subject to the mitigation measures imposed by BLM in the EA and the DR/FONSI. It is significant that, in consideration for the grant of Applications for Permit to Drill wells on the Federally owned 12 percent of the Project lands, the developers would be required to implement the mitigating measures set out in the EA involving the entire Project area, including operations on the 88 percent of the Project lands which are not Federally owned. 6/

Under the EA, impacts from CBM water discharge would be mitigated through the design of a water management plan for each affected watershed. (Project EA at 68.) Thus, for example, if there were any irrigated lands in the watershed, measures would be required to convey discharged water around these lands to avoid impacts. Id. Regular monitoring of discharge points and dam outlets for signs of structural failure or accelerated erosion, along with required remedial work would also be mandated. (Project EA, Ex. C, at C-22.) When evaluating the impact of operations on the Federal lands, one must also consider the reduced overall impact resulting from the mitigation of impacts on the non-Federal lands, keeping in mind that producing operations will occur on the non-Federal lands, regardless of Federal land development. Development on the non-Federal

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6/ In the water management plan for the Bar N Draw, for instance, the vast majority of the proposed wells are on State or private tracts and not Federal tracts. (Project EA, App. C, at Fig. 2.)

lands without the mitigating measures could well result in greater adverse impact than the mitigated impact resulting from development of the entire Project area.

In a context in which Federal development is only a small part of a larger project which is already under way and which will continue with or without Federal approval, it has been held that evaluation of the incremental impact when added to the reasonably foreseeable actions of others "entails consideration of the foreseeable actions of others as background factors, but does not require that the impacts of others' actions be weighed in assessing the significance of [the Federal] actions." Landmark West! v. United States Postal Service, 840 F. Supp. 994, 1011 (S.D.N.Y. 1993), aff'd, 41 F.3d 1500 (2d Cir. 1994); see Defenders of Wildlife, 152 IBLA 1, 8 (2000). In this case, BLM analyzed the cumulative impacts of development of the Federal and the non-Federal CBM in the Project area. I find that the failure to analyze the impact of development of the CBM wells in Montana does not constitute a breach of the responsibility to consider cumulative impacts which would impeach the FONSI reached by BLM. Accordingly, I would affirm the BLM decisions on appeal.

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C. Randall Grant, Jr.
Administrative Judge

I concur:

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R.W. Mullen
Administrative Judge

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James F. Roberts
Administrative Judge